

A Systematic Review of Outcomes and Quality Measures in Adult Patients Cared for by Hospitalists vs Nonhospitalists

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A systematic review of English-language literature was undertaken to answer the question, "Are there differences in cost or quality of inpatient medical care provided to adults by hospitalists vs nonhospitalists?" A computerized search was performed, using *hospitalist* and either *quality*, *outcome*, or *cost* as search terms. References from relevant articles were searched by hand. A standard data-extraction tool was used, and articles were included on the basis of quality and relevance. The reports that were included (N=33) show general agreement that hospitalist care leads to shorter length of stay and lower cost per stay. Three reports show improvement in outcomes for orthopedic surgery patients who had hospitalist consultation or comanagement, 3 reports show improvement in markers of quality of care for patients with pneumonia, and 2 reports show improvement in aspects of heart failure management. Further research should seek to determine why differences in care exist, whether these improvements might be generalized to other physicians, and whether hospitalists provide demonstrable benefit in other areas of care.

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In the United States, general medical inpatient care is provided by both hospitalists (who provide only inpatient care) and more traditional, nonhospitalist physicians (who provide both outpatient and inpatient care). Although the hospitalist model of care is established and accepted in Canada and the United Kingdom, the first hospitalist program in the United States, the Park Nicollet program in Minnesota, was not established until 1994.¹ A growing effort is being made to determine whether a difference in care exists between these 2 groups of physicians because a systematic difference would have implications for the cost and quality of care.

Reviews of hospitalist care were previously undertaken by Wachter and Goldman,² Wachter,³ and most recently Coffman and Rundall.⁴ Since the 2005 review by Coffman and Rundall, a number of reports on hospitalist care (including 20 articles cited in this review) have compared hospitalists and nonhospitalists in terms of cost, length of stay (LOS), and quality measures. The previous reviews generally concluded that hospitalist care leads to lower cost per admission and shorter LOS without altering patient satisfaction.

This review collects and synthesizes all available reports of trials that help answer the question, "Are there differences in cost or quality of inpatient medical care provided to adults by hospitalists vs nonhospitalists?" The review is undertaken now because of the number of new articles since the last review and because of the importance of identifying any modifiable differences between hospitalists and other physi-

cians that might lead to systematic improvements in cost or quality of care.

MATERIALS AND METHODS

A systematic review of the English-language literature was undertaken to answer the question, "Are there differences in cost or quality of inpatient medical care provided to adults by hospitalists vs nonhospitalists?" Articles were included if they contained data on outcomes, quality measures, or cost of care delivery from randomized trials or observational studies of adult patients cared for by hospitalists vs nonhospitalists. Articles were excluded if they pertained to pediatric or critical care hospitalists rather than general medicine hospitalists. Articles were excluded if they compared factors in addition to type of attending physician (for example, articles comparing a service with residents or a discharge planner and a service without). Poor-quality articles were also excluded (for example, if they had no comparison group, used estimated numbers of outcomes for a control group, or did not report significance or *P* values).

Searches for relevant articles were conducted on the National Library of Medicine Gateway (<http://gateway.nlm.nih.gov/gw/Cmd>) and on the Cochrane Collaboration Web site (www.cochrane.org). Search terms included *hospitalist* and either *quality*, *outcome*, or *cost*. Articles were screened by title and then by abstract. In addition, on the National Library of Medicine Web site, the Related Articles search tool was used after relevant articles were selected. References in the selected articles were searched by hand for further research reports on the topic that might not have been located in the original searches. The search included articles published up to August 1, 2008.

The selected articles were evaluated for study quality according to the methods outlined by the *Cochrane Handbook for Systematic Reviews of Interventions*.⁵ The methods included classification of articles on the basis of study type and scrutiny of articles for methodological flaws. A

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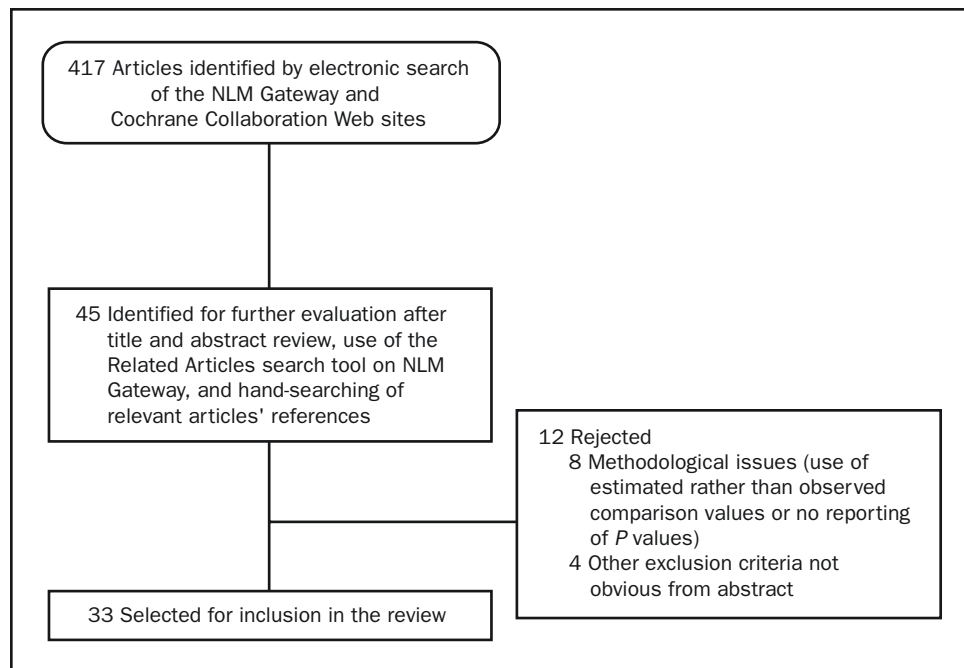


FIGURE. Flow of information through the systematic review process. NLM = National Library of Medicine.

formal information tracking and evaluation tool was used for data extraction.

A flowchart similar to that outlined by the QUOROM (Quality of Reporting of Meta-analyses) statement⁶ was used to track the flow of reports through the evaluation process (Figure).

RESULTS

Results of this systematic review of hospitalist vs non-hospitalist care of general medical patients as they relate to cost, LOS, and other markers of quality is presented in Table 1.⁷⁻²⁷ In general, the results show that inpatient care by hospitalist physicians leads to decreased hospital cost and LOS. Exceptions to this conclusion include 3 reports showing no significant difference in most quality measures between hospitalists and nonhospitalists^{26,28,29} and 2 reports showing generally better performance by either a family medicine service⁸ or a cardiologist-directed service³⁰ than by hospitalist care. Three reports describe the need for fewer subspecialty consults by hospitalists than by non-hospitalists.^{14,31,32} A few reports describe improved survival in patients cared for by hospitalists vs nonhospitalists.^{7,19,20}

Hospitalist care was also reported to improve several measures of care for specific services or conditions, including orthopedic surgery, pneumonia, and congestive heart failure. Interestingly, improvement was not seen for pa-

tients with human immunodeficiency virus or low-risk chest pain (Table 2²⁸⁻³⁹).

Orthopedic surgery patients cared for or comanaged by hospitalists had a shorter time to surgery (25 vs 38 hours; $P<.001$),³⁵ a shorter time to consultation, and a shorter total LOS than those cared for by nonhospitalists.^{35,36} Huddleston et al³⁴ reported fewer complications at discharge for orthopedic surgery patients comanaged by hospitalists. Rifkin et al³⁷ found that hospitalists caring for patients with pneumonia were more likely than nonhospitalists to give appropriate prophylaxis against venous thromboembolism (96.9% vs 61.9%; $P<.001$) and more likely to give pneumococcal vaccine or to document the reason for not doing so (88.2% vs 65.6%; $P=.001$). Two studies reported decreased cost and LOS for hospitalized patients with pneumonia cared for by hospitalists vs nonhospitalists.^{31,38} Lindenauer et al³⁹ reported that, for patients with congestive heart failure, hospitalists were more likely than nonhospitalists to have documented the ejection fraction (94% vs 87%; $P=.04$); their patients also had a shorter LOS. Another study of congestive heart failure showed improvement in use of angiotensin-converting enzyme inhibitors or angiotensin II receptor blockers and in LOS in patients cared for by hospitalists vs nonhospitalists.³² A multicenter study comparing services directed by academic hospitalists with those directed by academic generalists showed no difference in most quality measures for patients with congestive heart

TABLE 1. Reports of HP vs Non-HP Care of Adult Patients: Results Related to Cost, LOS, and Some Other Measures of Quality^{a,b}

Reference, location, y	Hospital type	Study type	Comparison	Methodological problems	Reported results
Auerbach et al, ⁷ San Francisco, CA, 2002	Community-based teaching hospital	Retrospective cohort, multivariate adjustment	HPs vs community physicians	Single site, only 5 hospitalists	LOS and costs not different in first year; in second year, LOS 0.61 d shorter for HPs than non-HPs ($P=.002$) and cost per stay \$822 less for HPs ($P=.002$); risk of death lower for HP patients in hospital (0.71, $P=.03$) and at 30 d and 60 d
Carek et al, ⁸ Charleston, SC, 2008	For-profit community hospital	Retrospective cohort	HP vs family medicine teaching service vs own primary care physician	Single site	Lower LOS for family medicine teaching service (4.0 d vs 4.7 d for HPs vs 5.4 d for primary care; $P<.001$); readmission not significantly different; fixed and variable costs less for family medicine teaching service; fixed costs \$1719 for family medicine teaching service vs \$2072 for HPs vs \$2036 for primary care service ($P=.005$); variable costs \$2318 for family medicine teaching service vs \$2689 for HPs vs \$2656 for primary care physicians ($P=.006$)
Davis et al, ⁹ Tupelo, MS, 2000	Rural community hospital	Retrospective cohort	HP vs non-HP general internist care	Single site, only 2 HPs studied	Hospitalist mean LOS 4.1 d vs 5.5 d for general internists ($P=.001$); hospitalist cost per stay \$4098 vs \$4658 ($P=.001$); HPs tended to use fewer resources ($P=.001$)
Diamond et al, ¹⁰ Pittsburgh, PA, 1998	Urban community teaching hospital	Crossover	HP vs primary physician care	Single site, historical controls	Lower median LOS for HPs (5.01 d vs 6.81 d; $P<.001$); median cost of stay less for HPs (\$3552 vs \$4139; $P<.001$); HPs had lower 14-d readmission rate (7.9% vs 17.2%; $P<.001$) and lower 30-d readmission rate (4.6% vs 9.9%; $P<.001$)
Everett et al, ¹¹ Orlando, FL, 2007	Urban community hospital	Retrospective cohort, multivariate adjustment	Private HPs vs non-HP general internists vs academic internist team care	Single site	LOS lower for HPs than non-HPs (3.7 d vs 4.3 d; $P<.001$); cost lower for HPs than non-HPs (\$4402.50 vs \$4761.30; $P<.001$); mortality equivalent for HPs and generalists; academic HPs had LOS of 2.6 d and cost of \$3333.80 (both less than for nonacademic HPs and generalists; $P<.001$); odds of readmission 0.79 for HPs vs academic HPs and 0.78 for academic HPs vs generalists
Everett et al, ¹² Orlando, FL, 2004	Urban community teaching hospital	Retrospective cohort, multivariate adjustment	HPs vs non-HP general internist care	Single site	16.1% lower LOS and 8.3% lower cost per stay for HPs vs non-HPs (reported as "significant" but no P value stated)
Gregory et al, ¹³ Boston, MA, 2003	Academic medical center	Crossover, comparison with historical controls	HP vs non-HP care	Single facility, historical controls	LOS 2.19 d for HPs vs 3.48 d for non-HPs ($P<.001$); cost per admission less for HPs (\$1775 vs \$2332 for non-HPs; $P<.001$); cost per day of admission more for HPs (\$811 vs \$679 for non-HPs; $P<.001$); increased throughput was thought to increase hospital profitability with HPs
Hackner et al, ¹⁴ Los Angeles, CA, 2001	Academic medical center	Retrospective cohort, multivariate analysis	HP vs non-HP care	Single facility	Median LOS 3 d for academic HPs vs 4 d for nonacademic generalists ($P<.0001$); median cost less for HPs (\$4002 vs \$4853 for nonacademic generalists; $P<.0001$); subspecialty consults less for academic HPs (16.6% vs 37.6% for nonacademic generalists; $P<.001$); changes most notable for patients older than 65 years; no significant difference in mortality or 30-d readmission rate
Halasyamani et al, ¹⁵ Ann Arbor, MI, 2005	Community teaching hospital	Retrospective cohort, multivariate adjustment	Private HP vs academic HP vs community physician care	Single facility	20% reduction in LOS for academic HPs ($P<.0001$) and 8% reduction for private HPs ($P=.049$) vs community physicians; total costs 10% less for academic generalists ($P<.0001$) and 6% less for private HPs ($P=.02$) vs community physicians; difference in costs and 30-d mortality not significant
Halpert et al, ¹⁶ Boston, MA, 2000	Academic medical center	"Crossover" cohort with historical controls and multivariate adjustment	"Inpatient physician" vs general internal medicine care	Single facility, historical controls	LOS decreased by 0.3 d ($P=.008$) and cost decreased by \$462 per admission ($P=.001$) for inpatient physician vs general internal medicine care; decreased charges thought secondary to decreased LOS; mortality rate and 30-d readmission not significantly different
Kaboli et al, ¹⁷ Iowa City, IA, 2004	Academic hospital	Prospective cohort, multivariate adjustment	HP vs non-HP care	Only 3 hospitalist physicians, single site, nonrandom assignment	LOS shorter for HPs (5.5 d vs 6.5 d for non-HPs; $P=.009$), adjusted cost per admission 10% less for HPs vs non-HPs ($P=.004$); similar mortality and 30-d readmission rates
Lindenauer et al, ¹⁸ 45 US hospitals, 2007	Mostly small to mid-sized nonteaching hospitals	Retrospective cohort, multivariate adjustment	HP vs family medicine vs general internal medicine care	Observational	HPs had shorter LOS than general internists by 0.4 d ($P=.001$) and lower cost per stay by \$268 ($P=.02$); HPs had shorter LOS than family practitioners by 0.4 d ($P<.001$), and lower cost per stay of \$125 was not significant ($P=.33$); death rates and readmission rates were not significantly different
Meltzer et al, ¹⁹ Chicago, IL, 2001	Not stated	"Longitudinal trial"	HP vs non-HP care	Single hospital	No difference in LOS or cost between HPs and non-HPs in year 1; in year 2, LOS 0.5 d less for HPs ($P<.01$) and cost per stay \$740 less for HPs ($P<.01$); in first year of program, no difference in mortality; by second year, lower 30-d mortality for HPs (4.2% vs 6% for non-HPs; $P=.04$)
Meltzer et al, ²⁰ Chicago, IL, 2002	Academic medical center	Cohort with multivariate adjustment	HP vs non-HP care	Nonrandom assignment, single site, only 2 HPs	By second year of study, LOS 0.49 d shorter for HPs than non-HPs ($P=.01$), cost per stay \$782 lower for HPs ($P=.01$); adjusted relative risk of death 0.65 for HPs vs non-HPs ($P=.03$); LOS, cost, and mortality all seemed to improve over the time the service was in place

(Continued)

TABLE 1. Continued^{a,b}

Reference, location, y	Hospital type	Study type	Comparison	Methodological problems	Reported results
Molinari & Short, ²¹ Washington state, 2001	Regional medical center	"Pre and post" crossover, multivariate adjustment	HP vs non-HP care	Historical controls, 5 hospitalists studied	From a managed care standpoint, HPs more likely than non-HPs to have fewer medically unnecessary days (OR, 1.64; $P<.05$) and to meet "optimal recovery guidelines" (OR, 1.74; $P<.001$)
Palmer et al, ²² Morgantown, WV, 2001	Academic center	Retrospective cohort	General internal medicine care by HP vs general internist vs subspecialist	Single institution	No difference observed between study groups of patients in whom further evaluation was thought necessary at hospital discharge and those for whom testing was scheduled on an outpatient basis after hospital stay
Parekh et al, ²³ Ann Arbor, MI, 2004	Academic center	Retrospective cohort, multivariate adjustment	General medicine care by HP vs specialty physician	Single site	For general medical patients, HPs LOS 4.31 d vs rheumatologists 4.97 d ($P=.002$) vs endocrinologists 4.79 d ($P=.03$); HPs cost per stay \$7267 vs endocrinologists \$8376 ($P=.01$); readmission and mortality not significantly different
Rifkin et al, ²⁴ not stated, 2004	Academic center cohort with multivariate adjustment	Retrospective	HP vs non-HP care	Single institution	Adjusted OR for having above average LOS 0.6 for HPs vs non-HPs ($P=.11$)
Southern et al, ²⁵ Bronx, NY, 2007	Academic center	Retrospective cohort	HP vs non-HP care	Only 5 HPs, single institution	Mean LOS less for academic HPs than for non-HPs (5.01 d vs 5.87 d; $P<.02$); reduction in LOS greatest for patients requiring close clinical monitoring and complex discharge planning; no difference in in-hospital mortality, 30-d mortality, or readmission
Tingle & Lambert, ²⁶ Garland, TX, 2001	Community hospital with family medicine residency	Retrospective cohort	HP vs family medicine teaching service care	Single site, powered to detect difference in LOS of half a day and \$1000 cost	No statistically significant difference between HP service and family practice teaching service in cost, LOS, or mortality
Wachter et al, ²⁷ San Francisco, CA, 1998	Community hospital	"Alternate day controlled" trial, multivariable adjustment	Managed care (HP) service vs traditional service care	Nonrandom assignment, single site	Mean LOS 4.3 d for managed care service vs 4.9 d for traditional service ($P=.01$); average cost \$7007 for managed care service vs \$7777 for traditional service ($P=.05$); mortality and readmission rates similar; most of cost reduction suggested to result from decreased LOS

^a HP = hospitalist; LOS = length of stay; OR = odds ratio.

^b The patient groups studied are general medical service patients unless otherwise stated.

failure.²⁸ Quality measures for care of patients with the human immunodeficiency virus were not improved by an academic hospitalist vs academic generalist service.²⁹ For low-risk patients with chest pain, LOS and readmission rates were better for a chest pain unit managed by a cardiologist than for routine management by hospitalists.³⁰

DISCUSSION

In general, the reports included in this review show that inpatient care of general medical patients by hospitalist physicians leads to decreased hospital cost and LOS.

Hospitalist programs appear to mature with time, perhaps because of adjustment by hospitalists or increased experience. Several studies have shown that hospitalist programs did not have an effect (or had lesser effect) on cost or LOS during their first year but did have notable effect during their second year.^{7,19,20}

Several theories have been offered to explain the apparent differences between hospitalist and nonhospitalist outcomes. According to one theory, hospitalists are able to respond more rapidly to changes in a patient's condition because they tend to be in-house with no competing clinic

responsibilities.⁴⁰ Another theory holds that hospitalists likely have more practice or experience tending to inpatient medical problems.² (This has been called *disease-specific physician experience*.²⁰)

Several recent reports have shown that the higher daily cost per patient of hospitalists is compensated for by the more rapid discharge of patients from the hospital. One study examined the possibility that the reported decreases in costs by hospitalists are due to incomplete evaluation of patients in the hospital. In other words, the costs of any tests not completed in the hospital would be passed on to outpatient clinics after hospitalization, making hospitalists only appear more efficient. The investigators concluded that this was not the case in their study population.²² Economic analysis suggests that hospitalists increased profitability by moving patients more quickly ("higher throughput") through hospital systems that had beds in short supply.¹³

Many of the research reports referenced in this review are observational studies with associated nonrandom allocation, and several of the prospective studies also had nonrandom assignment. Nonrandom assignment of patients can allow bias to occur and can also allow unequal levels of a confounding factor in different study groups,

TABLE 2. Condition-Specific Reports of HP vs non-HP Care of Adult Patients: Results Related to Quality-of-Care Measures^a

Reference, location, y	Hospital type	Study type	Comparison	Methodological problems	Reported results
Orthopedic surgery^b					
Batsis et al, ³³ Rochester, MN, 2007	Academic tertiary care hospital	Retrospective cohort with multivariate adjustment	HP vs non-HP comanagement of hip fracture patients	Single site	No difference in survival 1 y after hip surgery between HP and non-HP care patients: 70.5% (95% CI, 64.8-76.7) vs 70.6% (95% CI, 64.9-76.8); $P=.36$
Huddleston et al, ³⁴ Rochester, MN, 2004	Teaching hospital (primarily surgical)	Randomized, controlled	Comanagement by HP vs standard orthopedic care with medical consultation	Single site, nonblinded	More HP patients discharged without complications (61.6% vs 49.8% for non-HPs; $P=.01$); costs not different between groups; adjusted LOS shorter for HPs (5.1 d vs 5.6 d for non-HPs; $P<.001$)
Phy et al, ³⁵ Rochester, MN, 2005	Academic center	Crossover	HP comanagement of hip fracture patients vs orthopedic surgery management with as-needed medical consultation	Single institution, historical controls	Mean time to surgery less with HP comanagement (25 h vs 38 h without HP involvement; $P<.001$); time from surgery to discharge less with HP involvement (7 d vs 9 d; $P=.04$); LOS less with HP involvement (8.4 d vs 10.6 d; $P<.001$); no significant difference in mortality or readmission
Roy et al, ³⁶ Jacksonville, FL, 2006	Community-based academic medical center	Retrospective cohort	Consultation by HP vs non-HP in hip fracture surgery patients	Single site, 118 patients—perhaps too few to show a significant difference for LOS and cost	For hip fracture patients, time to surgery less than 24 h in 32% of patients with consultations by HPs and 11% of patients with consultations by non-HPs ($P=.004$); time to consultation 3 h by HP and 15.9 h by non-HP ($P<.001$); LOS 5 d for HP patients and 6 d for non-HP patients ($P=.06$); cost per stay \$11,043 for HP patients and \$12,820 for non-HP patients ($P=.08$)
Pneumonia^b					
Rifkin et al, ³⁷ Waterbury, CT, 2007	Community teaching hospital	Retrospective cohort	HP vs non-HP care	Single site	HPs more likely than non-HPs to give pneumococcal vaccine or document the reason for not doing so (88.2% vs 65.6%, $P=.001$); HPs more likely to give appropriate DVT prophylaxis (96.9% vs 61.9%; $P<.001$); LOS not significantly different between HPs and non-HPs
Rifkin et al, ³¹ New Hyde Park, NY, 2002	Community hospital	Retrospective cohort with multivariate adjustment	HP vs primary physician care	Single center	Adjusted cost per stay \$3907 for HPs vs \$4501 for primary care physicians ($P=.03$); adjusted LOS 5.6 d for HPs vs 6.5 d for primary care physicians ($P=.001$); use of infectious disease consultants more likely by primary care physicians than by HPs (5% vs 2%; $P=.05$); no significant difference in hospital mortality or readmission rate
Scheurer et al, ³⁸ South Carolina, 2005	Hospitals statewide	Retrospective cohort from statewide database	HP vs non-HP care	Observational	For pneumonia patients with moderate illness, LOS was 4.9 d with HP care vs 5.2 d with non-HP care ($P=.04$); for major illness, 7.4 d vs 8 d ($P=.03$); and for extreme illness, 10.6 d vs 12.9 d ($P=.02$); mean charges for major illness were \$20,950 with HP care vs \$23,259 with non-HP care ($P=.03$); mean charges for extreme illness were \$42,045 with HP care vs \$56,867 with non-HP care ($P=.002$)
Congestive heart failure^b					
Lindenauer et al, ³⁹ Springfield, MA, 2002	Community teaching hospital	Retrospective cohort, multivariate adjustment	HP vs non-HP care	Single institution	Ejection fraction was appropriately documented for more patients by HPs than by non-HPs (94% vs 87%; $P=.04$); LOS shorter for HPs than non-HPs ($P=.03$); mortality and readmission at 30 d were no different
Roytman et al, ³² Honolulu, HI, 2008	Community-based teaching hospital	Retrospective cohort	HP vs non-HP care	Observational, single site	Compared with non-HP care, HP care was associated with increased use of ACE inhibitors or ARBs (86% vs 72%; $P=.003$), decreased use of multiple consultants (8% vs 16%; $P=.03$), decreased cost ($P<.001$), and decreased LOS ($P=.002$); readmissions were similar
Vasilevskis et al, ²⁸ multicenter, 2008	6 academic hospitals	Retrospective cohort	Academic HP vs academic non-HP care	Observational	No difference between HPs and non-HPs in measurement of ejection fraction, use of ACE inhibitors, use of β blockers, LOS, mortality, or cost; HP patients had higher odds of keeping follow-up appointments (OR=1.83; 95% CI, 1.44-2.93)
HIV^b					
Schneider et al, ²⁹ multicenter, 2008	8 academic hospitals	"Natural experiment"	HP vs non-HP care	Nonrandom assignment	No improvement in HIV care measures, including LOS, by HPs vs non-HPs
Chest pain^b					
Somekh et al, ³⁰ New York, NY, 2008	Academic medical center	Retrospective cohort	Dedicated chest pain unit run by cardiologist vs HP service vs private service	Observational, single site	For lower-risk chest pain patients, LOS was shorter with a dedicated chest pain unit run by a cardiologist than with HP care (1.4 d vs 3.9 d; $P<.001$) and readmission rate within 6 mo was lower (4.4% vs 17.6%; $P<.001$)

^a ACE = angiotensin-converting enzyme; ARB = angiotensin II receptor blocker; CI = confidence interval; DVT = deep venous thrombosis; HIV = human immunodeficiency virus; HP = hospitalist; LOS = length of stay; OR = odds ratio.

^b Items are presented by condition or service type because they were thus reported in the medical literature.

even if such bias and inequity are not readily apparent. For example, with nonrandom assignment, we might expect a larger number of acutely ill patients with pneumonia to be admitted by critical care physicians than by hospitalists and a larger number to be admitted by hospitalists than by a family medicine service, making comparisons about cost, survival, and LOS difficult. In this review, several studies had fewer than 5 hospitalists in the study group, and many studies were done at a single institution. Both of these factors may result in bias related to personal characteristics of a few physicians or to regional differences in practice. Among the articles in this review, reporting of results is nonuniform, with some articles reporting means, others medians, and some only ratios. The reports as a group are heterogeneous, making a meta-analysis inappropriate.

Systematic reviews may be hampered by difficulties related to publication bias, in which articles are more likely to be published if they show positive findings. This limitation is not confined to this review but is a potential problem for any review. I am unaware of any unpublished data on the topic of this review. Whether to include unpublished data should be an important consideration in conducting a systematic review. Investigators need to remember, however, that bias against negative results is not the only reason why a manuscript may be unpublished; a manuscript may have any of a number of inadequacies that disqualify it from consideration for publication.

CONCLUSION

Despite limitations in the quality of available reports, common themes emerge from this review of hospitalist care. In general, hospitalist care appears to result in lower cost per admission, largely because of shorter LOS, although use of fewer consultants has been observed by some investigators as well. A few reports show differences in other measures of quality, such as mortality, readmission rate, and performance in specific populations, such as patients with pneumonia, those with congestive heart failure, and those undergoing orthopedic surgery.

Further studies should investigate whether benefits shown for hospitalist care might be generalized to other physicians. These studies should also examine whether differences between hospitalists and nonhospitalists exist in other areas of care, with the intent again being to define the reason for any differences so that any improvements in care can be generalized to other physicians.

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